INSTRUCTION MANUAL
FOR

SB-540D

40-CHANNEL

MICROPROCESSOR CONTROLLED CITIZENS BAND SOLID STATE AM/SSB BASE STATION TRANSCEIVER

ROBYN INTERNATIONAL INC.
10901 NORTHLAND DRIVE
ROCKFORD, MI 49341

SPECIFICATIONS

GENERAL

Channels	40
Frequency Range	26.965 MHz to 27.405 MHz
Frequency Control	PLL Synthesizer
Frequency Stability	0.005 %
Input Voltage	13.8VDC and 117VAC 50/60 Hz
Dimensions	426mm (w), 140mm (H), 230mm (D)

TRANSMITTER

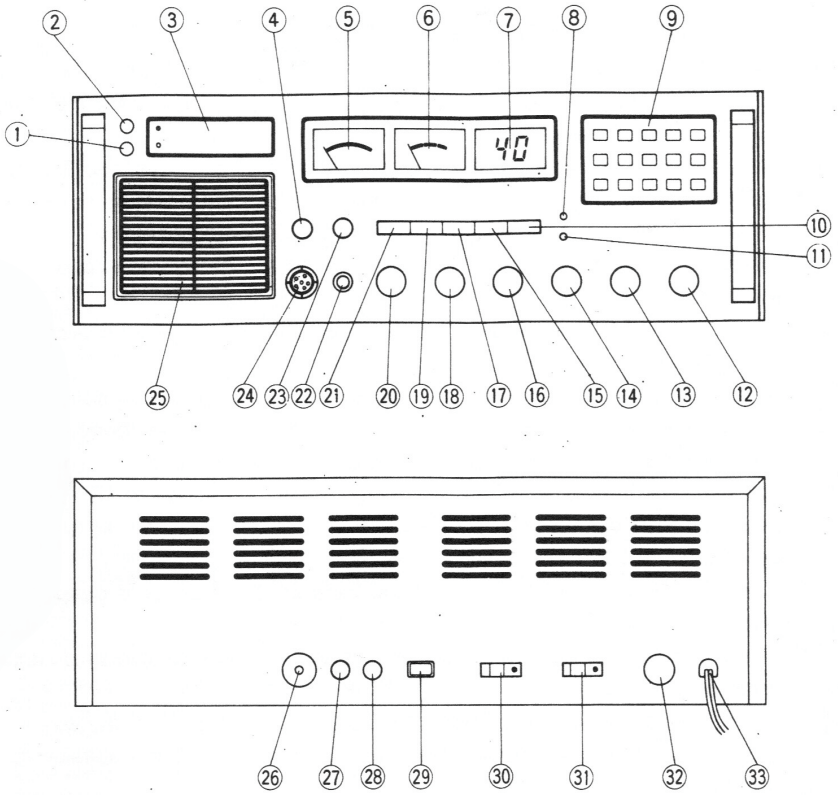
Power Output	AM: 4 watts SSB: 12 watts (PEP)
Modulation	AM: High level Collector modulation SSB: Low level balanced modulator and filter
Spurious Radiation	All spurious and harmonics are more than 60dB below the carrier.
SSB Carrier Suppression	more than 40dB
Antenna Impedance	50 ohms (nominal)

RECEIVER

Sensitivity	AM: 0.5uV for 10dB S + N/N SSB: 0.3uV for 10dB S + N/N
Adjacent Channel Rejection	AM: 70dB (10 KHz) SSB: 70dB (10 KHz)
Image Rejection	65dB
Spurious Rejection	60dB
Intermediate Frequency	10.6935 MHz
IF Rejection	65dB
AGC	Less than 10dB increase in audio output for input of 5uV to 50mV
Squelch	Adjustable. Threshold less than 1uV
Clarifier Range	± 1.2 KHz available on unit and mic-control (clar-o-mic)
Audio Output Power	3.5 watts into 8 ohms
Frequency Response	350 to 2500 Hz
Distortion	less than 10 % at 3.5 watts output
Built-in Speaker	8 ohms, round

PA SYSTEM

Power Output	3.5 watts into external speaker



OPERATING CONTROLS

1) SLOW : Sets clock at slow speed (60/sec.)
2) FAST : Sets clock at fast speed (2/sec.)
3) Time Indicator : 12 hour LED display. (AC operation only.)
4) POWER : To turn power on, push in the button. To turn power off, push it again. This switch does not effect the clock or microprocessor memory.
5) S/RF Meter : Indicates strength of incoming signal in "S" units, and RF output power of the transmitter that is applied to the antenna.
6) SWR Meter : This meter is for checking the performance of the antenna. Its meter scale is graduated according to the ratio of the forward wave to the reflected wave of the transmission line (coaxial cable). Indication of "1" on the above scale (this means 1:1) signifies that the antenna is completely matched and free of reflected waves. Indications in increased digits, for instance "3" (this means 3:1), signifies the mismatching of the antenna to the cable and transmitter, and an adjustment must be made at the antenna for proper operation of your set.
7) Channel Indicator : LED digital display shows the channel that the transceiver is operating on.
8) TX Lamp : When the transmitter is on, the indicator lights up RED.
9) Operation Keys : These keys select any one of the Citizens Band channels and permits storing channels, scanning, delaying scan, and stopping scan for selective channel operation.
10) SPKR INT — EXT : The external speaker jack is activated when the switch is pushed in.

11) RX Lamp : When receiving, the indicator lights up GREEN.
12) Mode selector switch : Selects mode of operation on AM, LSB, or USB. The mode selector switch changes the mode of operation of both transmitter and receiver simultaneously.
13) MIC GAIN : This control is used to adjust the average TX modulation level and PA output level.
14) RF GAIN : RF gain of receiver may be reduced on strong signals by rotating the control counter clockwise. Usually, it should be kept at the full clockwise position.
15) NB — ON : This switch is used whenever it is desirable to reduce ignition noise or other man-made impulse noise.
16) CLARIFIER : Permits adjustment of receiver tuning used for clarity on SSB reception and fine tuning on AM reception.
17) CB — PA : CB position provides normal CB operation. PA position permits use of the transceiver as a public address system when in the transmit mode. This push type switch changes your transceiver into a public address system.
18) SQUELCH : This control is used to block out background noise when no signal is on the channel. The squelch is adjustable with the least sensitivity in the full clockwise position.
19) TONE — LOW : In the TONE — LOW position the tone of the receiver is deepened when the switch is pushed in.
20) VOLUME : Controls the audio output level of the speaker. A full clockwise position provides maximum output level.
21) SWR/CAL Switch : This switch is for adjusting the calibration of the SWR meter.
22) PHONES : Standard phone jack for headphone use; disconnects internal speaker and external speaker jack.
23) SWR CAL : This control is for adjusting the calibration of the SWR meter. Connect the antenna, turn to the AM mode, and turn on the power switch. Push the SWR CAL switch in. Then press the microphone button and adjust the CAL control so that the meter needle comes to the "CAL" point. For operation push the switch again to release and read the SWR on the meter.
24) MIC : A six pin connector for push-to-talk and clar-o-mic is provided with the unit.
25) Speaker : A round speaker is mounted behind the front plate.
26) ANTENNA : This is a connector for a 50 ohm Citizens Band antenna.
27) EXT SPKR : Jack for connection of external devices such as earphone or speaker. Insertion of a miniature phone plug into this jack will automatically disconnect the internal speaker.
28) PA SPKR : Special speaker jack for PA external speaker.
29) DC 13.8V : This connector connects to the DC power cord.
30) DC —AC Switch : This switch selects the power source. When you make use of the DC power source (car battery, 12 VDC supply, etc.), the switch should be in the "DC" position. To use the AC power source (normal 120VAC house current), the switch should be in the "AC" position.
31) POWER : This switch is for power ON/OFF (All power). This switch is necessary as the front power push button switch does not switch the clock and scanner memory off.
32) FUSE : This is fuse holder for AC input. (The fuse used should be 1 ampere maximum.)
33) AC Cord : The power cord for AC operation.

OPERATION KEYS

1(M1), 2(M2), 3(M3), 4(M4), 5(M5), 6, 7, 8, 9, 0(STOP), MEMO SCAN, MEMO ENTER, AUTO SCAN, MEMO RECALL SCAN DELAY.

DATA ENTRY KEYS

1, 2, 3, 4, 5, 6, 7, 8, 9, and 0 (which is also the stop key.)

1) OPERATION ON SELECTED CHANNEL*
   a. Push the two keys for the channel desired. For channels 1 through 9 push zero first.
   b. When you push the first button the E will be indicated along with the number of the button pushed. The E means enter one more digit. Enter the second digit. The display now shows the channel on which the transceiver is tuned.
   c. If the E will not clear then you have made an entry error. Normally this means you have entered one too few or one too many digits. Enter one more digit and start the sequence over.
   d. You may now operate on the channel shown on the display.
2) MEMORY SCAN — 1 to 5 CHANNELS*
   a. Turn squelch control fully clockwise.

The squelch control determines the sensitivity of the scanner to stop on a channel for a transmitting station. If the control is set counter clockwise the set will not scan. To control the selection of only stronger signals set the squelch control more clockwise. When the squelch is full clockwise only the very strongest signals will "break" the squelch and stop the scanning action.

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   b. Push the STOP key until the E is removed.
   c. Enter the channel you wish to program.
   d. Push the MEMO ENTER key.
   e. To store the channel in M1 push the M1 key. To store the entry in any of the other memory positions push the M2 or M3 or M4 or M5 button.
   f. Do the same for any four additional channels. Making sure to push the MEMO ENTER key each time.
   g. You may now operate the transceiver on the channels placed in the memory by pushing the MEMO SCAN key. The unit will scan at 240 m Sec/channel when the squelch is properly set. To delay the scan at an active channel push the scan delay key. (Note: Decimal point will light indicating switch is ON.) This will cause the receiver to hold on that channel for three seconds after the signal is OFF. This time delay will permit you to hear both stations before the set starts scanning again.
3) AUTOMATIC SCANNING OF ALL 40 CHANNELS
   The AUTO SCAN key activates the scan action by scanning the complete band of 40 channels. To delay the scan at an active channel on the 40 channel scan, push the scan delay key. This will permit you to hear both stations if they exceed the squelch level.
4) RECALL THE MEMORY FOR EXAMINATION
   To recall the memory, or examine the stored data in positions M1 through M5, push the MEMO RECALL key, if unit is not in the scan mode.
   a. Otherwise, push the STOP button first.
   b. Next, push MEMO RECALL.
   c. Then push the storage keys (M1, M2, M3, M4, or M5 as desired). After you push the key the readout will indicate the channel stored in that position and the unit will operate on the displayed channel.

d. Push the STOP key before operating the transceiver.

*With the Push-to-talk switch in transmit (the TX light is on), all keys are disabled and you cannot select channels.

INSTALLATION

AC POWER CONNECTION

Insert the AC power cord plug into the AC outlet. For protection, the AC input to the transceiver is fused within the unit. (Use only a 1 ampere fuse and operate on 120VAC — 50/60 Hz.)

DC POWER CONNECTION

Connect the 2 pin plug of the provided DC cord to the main transceiver unit after wires are connected to battery. Connect the red power lead to the positive terminal of the battery, and then connect the black lead to the ground terminal (—). This unit will operate on negative ground vehicles only.

ANTENNA CONNECTION

The antenna lead-in cable (RG-58U or RG8U) should be terminated with a PL-259 type coaxial connector which should then be attached to the antenna connector at the rear of the transceiver.

MICROPHONE CONNECTION

Attach the six pin connector at the end of the microphone coiled cord into the transceiver microphone connector on the front panel. Be certain that it is secured firmly with the knurled ring.

GENERAL DESCRIPTION

RECEIVER SECTION

This transceiver is designed to receive AM and SSB signals in the 26.965 to 27.405 MHz Citizen Band. The circuit is a highly sensitive and selective single-conversion super-heterodyne type with one RF and three IF amplifiers. Full 40 channel, crystal-controlled operation is provided by a PLL frequency-synthesized circuit.

The receiver section includes an S meter for reading signal strength, a tone control, an adjustable squelch control to eliminate background noise when no signal is being received, a Noise Blanker and an automatic noise limiter to suppress atmospheric and man-made interference, and a clarifier with a range of $\pm$1.2 KHz, which permits reception of stations that are transmitting slightly off frequency. The clarifier knob may be pulled out to operate the control from the clar-o-mic.

TRANSMITTER SECTION

The transceiver is designed to transmit AM or SSB signals in the 26.965 to 27.405 MHz Citizens Band. The PLL synthesized circuit used in the receiver section is common to the transmitter, and provides full 40 channel operation. A push-to-talk dynamic microphone controls the antenna relay switching and turns the transmitter on.

OPERATING INSTRUCTIONS

RECEIVE MODE (AM)

Initially, set front panel controls as follows:

CB/PA switch	— CB position
Mode switch	— AM
RF GAIN	— MAX. (full clockwise position)
CLARIFIER	— Center (12 o'clock position)
SQUELCH	— Min. (full clockwise position)
VOLUME	— Increase for desired volume

SQUELCH ADJUSTMENT (AM and SSB reception)

The squelch control is used for eliminating background noise when there are no signals present on the channel. To adjust the squelch control, select a channel where there is no signal. Turn the volume up to a fairly high level. Rotate the squelch control clockwise until the background noise disappears. This point is called the "squelch threshold", and at this squelch position the receiver will be quiet when there is no signal on the channel, but an incoming signal will be able to overcome the squelch action and be heard. This control is variable, and as it is advanced the squelch action is increased and consequently a stronger signal is required to break the threshold. To receive extremely weak signals or to disable the squelch circuit, merely turn the control fully counter-clockwise.

CLARIFIER (AM)

The clarifier control is primarily used for SSB reception and has a range of approximately ± 1.2 KHz but can be used for tuning in an AM station that is slightly off frequency. When using this control, tune for the best reception and the highest "S" meter reading. The clarifier does not effect the transmitter. Only the receive frequency is changed with this control. Pull the clarifier control knob out until it clicks to operate the unit from the clar-o-mic, an exclusive ROBYN feature.

S METER (AM)

During the receive mode, the "S" meter provides a relative indication of the strength of incoming signals. The S meter circuit has been preadjusted at the factory to indicate "S—9" with 100 microvolts at the antenna input.

RF GAIN (AM and SSB reception)

This control permits the listener to control the input signal separate from the audio gain. Thus, when listening to a strong station the RF can be turned down to prevent blasting. Usually, the control should be kept at the full-clockwise position for best sensitivity.

NOISE BLANKER (AM and SSB reception)

In the "NB-ON" position, the special Noise Blanker circuit and Noise Limiter (AM only) is switched in. The noise blanker is specially designed to combat static noise such as ignition noise.

TONE (AM and SSB reception)

In the "TONE-LOW" (pushed in) position, the receiver responds to the lower audio frequencies.

RECEIVE MODE (SSB)

Set all controls initially as follows:

CB/PA	— CB position
RF Gain	— Maximum (Fully clockwise)
Mode switch	— To be turned to USB or LSB
CLARIFIER	— Center (12 o'clock position)
SQUELCH	— Minimum (Fully counter clockwise)
VOLUME	— "VOLUME" to be set at desired level
Mode switch	— Select USB or LSB mode

CLARIFIER (SSB)

Use the clarifier control to fine tune the signal for the best clarity. Rotate the "Clarifier" control very slowly on either side of the 12 o'clock position (between the 7 o'clock position and the 5 o'clock position). Within this range it should be possible to clarify the sound so that the voice becomes understandable.

If you are unable to clarify the voice or hear the signal, it is possible that the signal is not on the sideband you are using. Switch the transceiver to the other sideband and repeat the adjustment of the "Clarifier" control in the mode, until you are able to clarify the voice. Switch to either USB or LSB.

CLAR-O-MIC (AM and SSB reception)

In the CLAR-O-MIC position (clarifier control pulled out) the clarifier of the receiver is located on the microphone, an exclusive ROBYN feature permitting "rocking-chair" operation when communicating with two or more stations.

PHONES (AM and SSB reception)

The front "PHONES" jack may be used to connect a headphone for normal CB operations. When the headphones are plugged into the PHONE jack the internal speaker and EXT SP are disengaged and the headphones are operational.

TRANSMIT MODE

> It is illegal to operate the transmitter section of this transceiver prior to receiving a valid station license and call sign. Part 95 of the FCC rules and regulations dealing with the Citizens Radio Service must be obtained, read, and understood.

Set all controls initially as follow:

CB/PA switch	— CB position
Mode switch	— To be selected AM, LSB, USB
MIC GAIN	— Rotate clockwise to increase the modulation

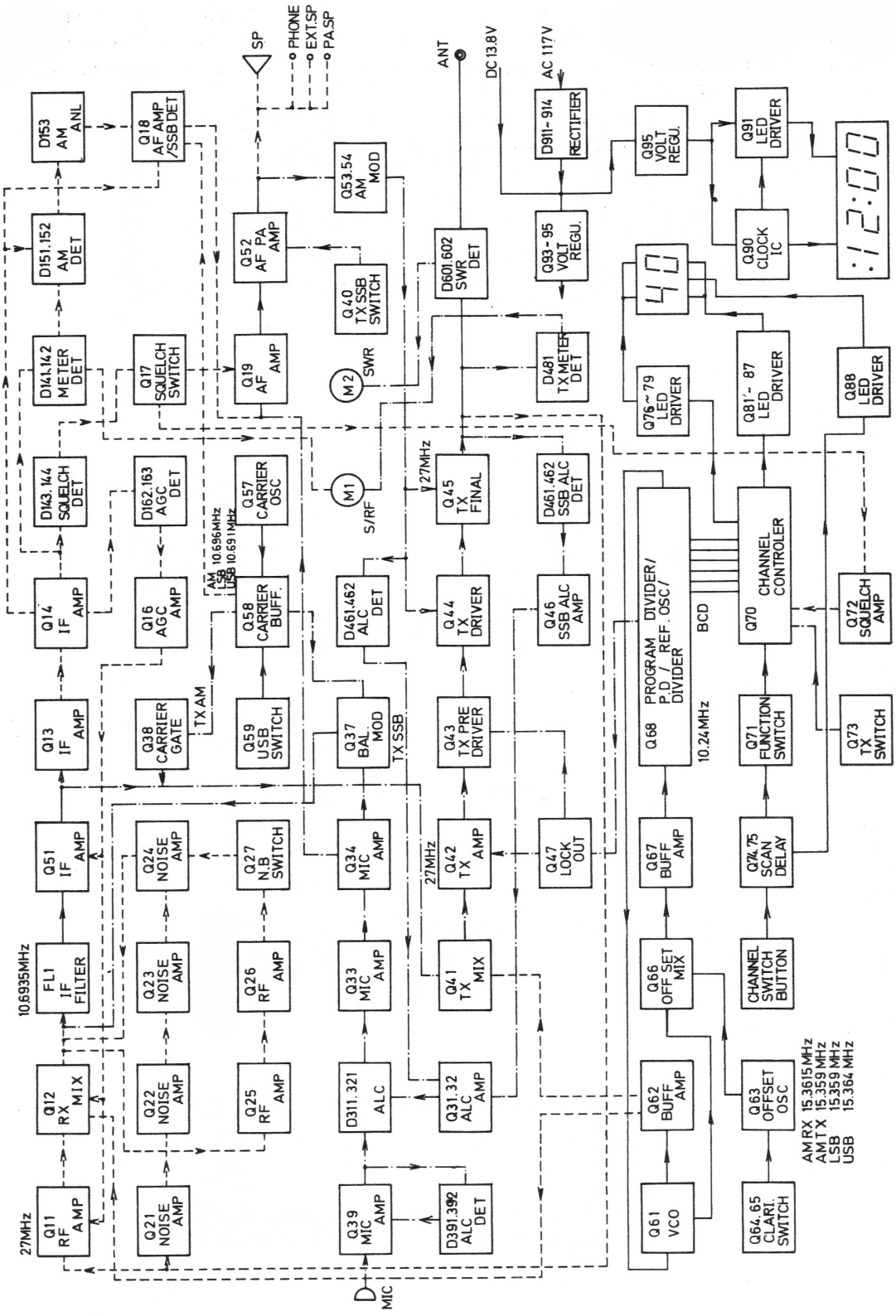
After you have selected the desired mode of operation by means of the AM, LSB, and USB selector switch, simply depress the push-to-talk button on the microphone. On transmitting in the AM mode, be sure that the RF power output meter flucuates in accordance with your voice. When the press-to-talk button is pressed while in the single sideband mode, the meter will produce no reading until you speak into microphone and provide modulation. When the press-to-talk button is pressed you cannot select channels.

PUBLIC ADDRESS OPERATION

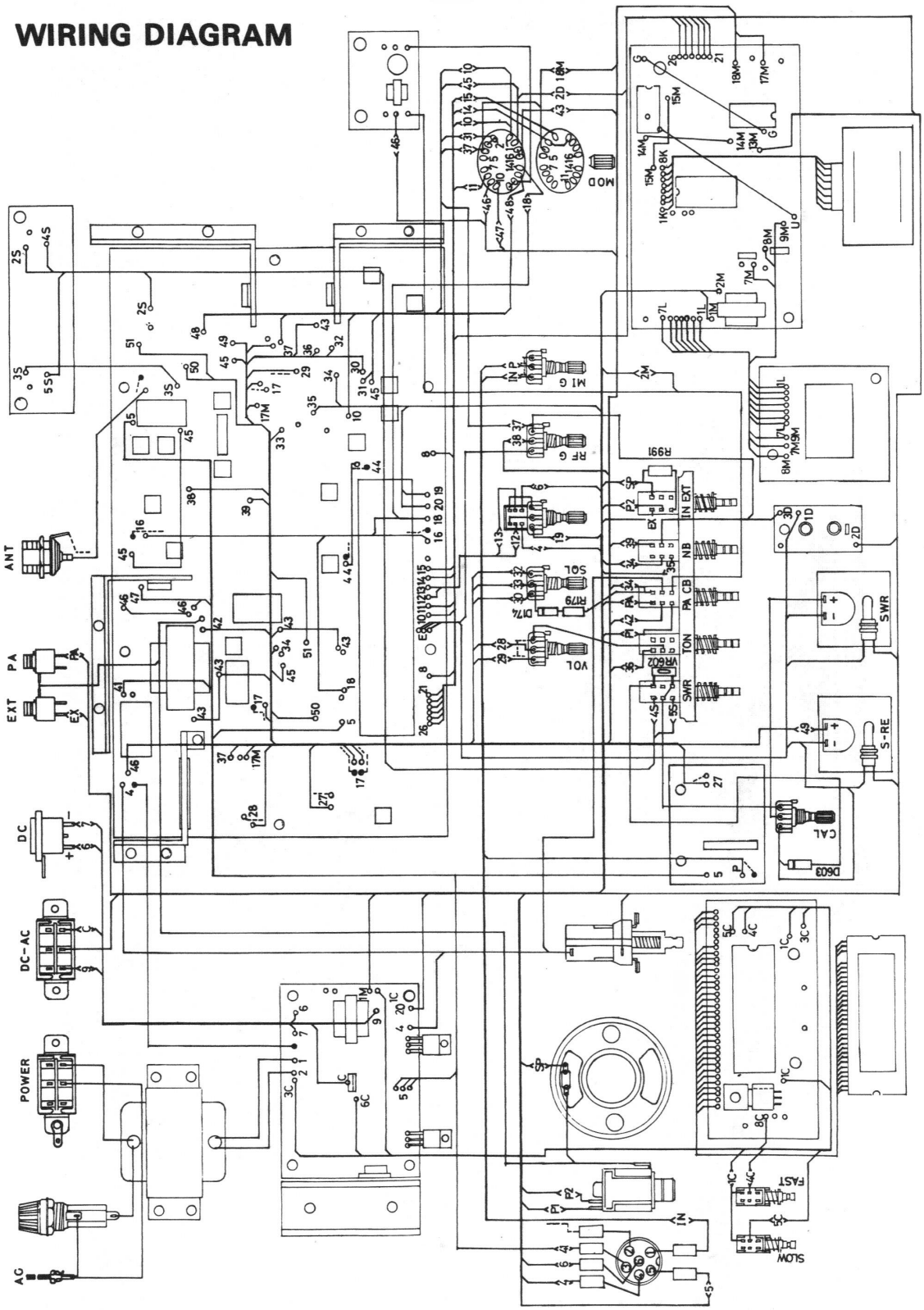
Provision has been made for utilizing this unit for public address operation. For PA connect an external 8 ohm speaker to the PA SPKR jack in the back of the unit. Push the CB/PA switch, press the push-to-talk switch on the microphone and talk into it as you would when transmitting on a CB channel.

Your voice will be heard on the external speaker; it will not radiate into your antenna and be transmitted. You can control the PA level with the MIC GAIN control.

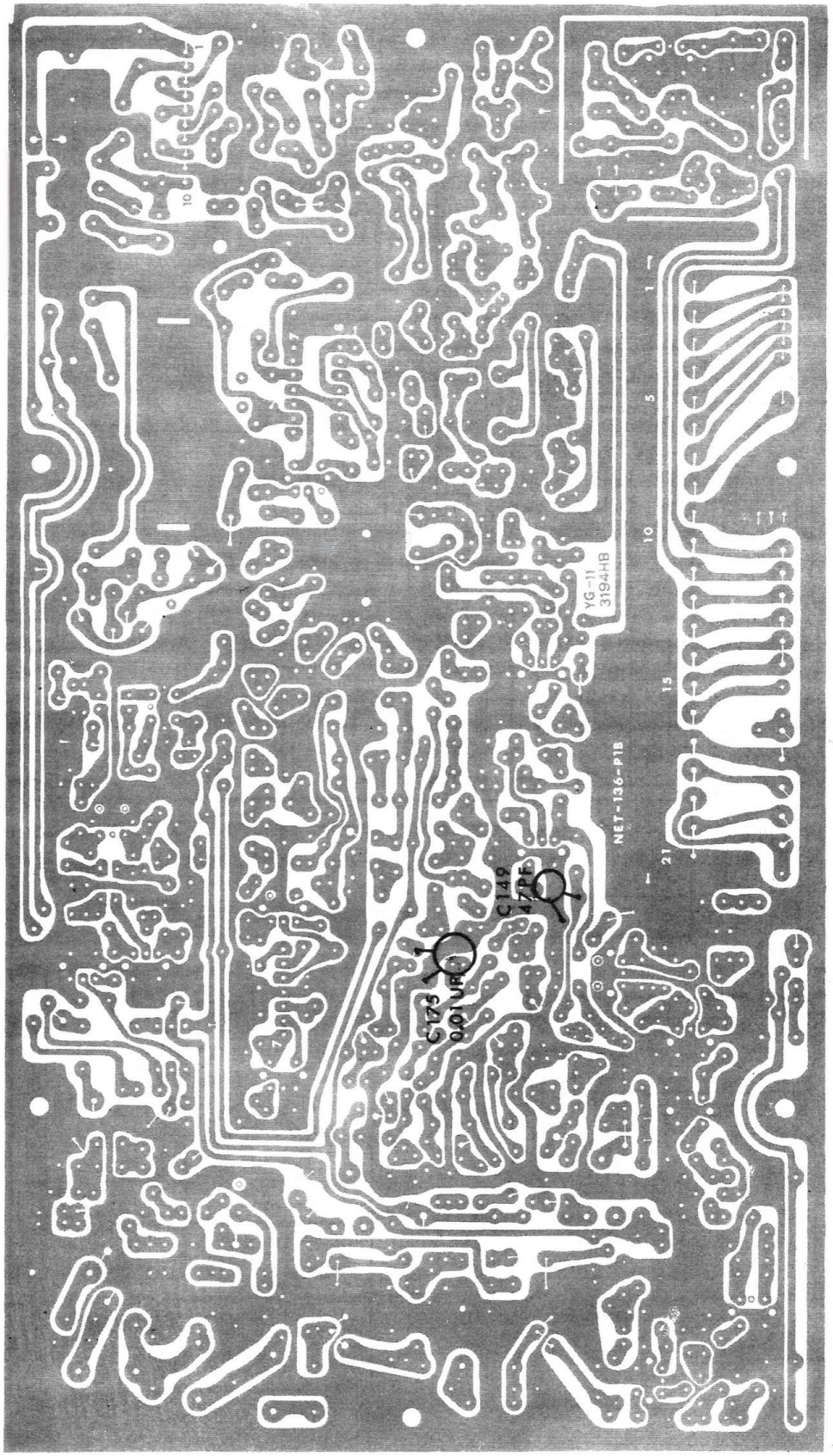
BLOCK DIAGRAM OF ROBYN SB-540D



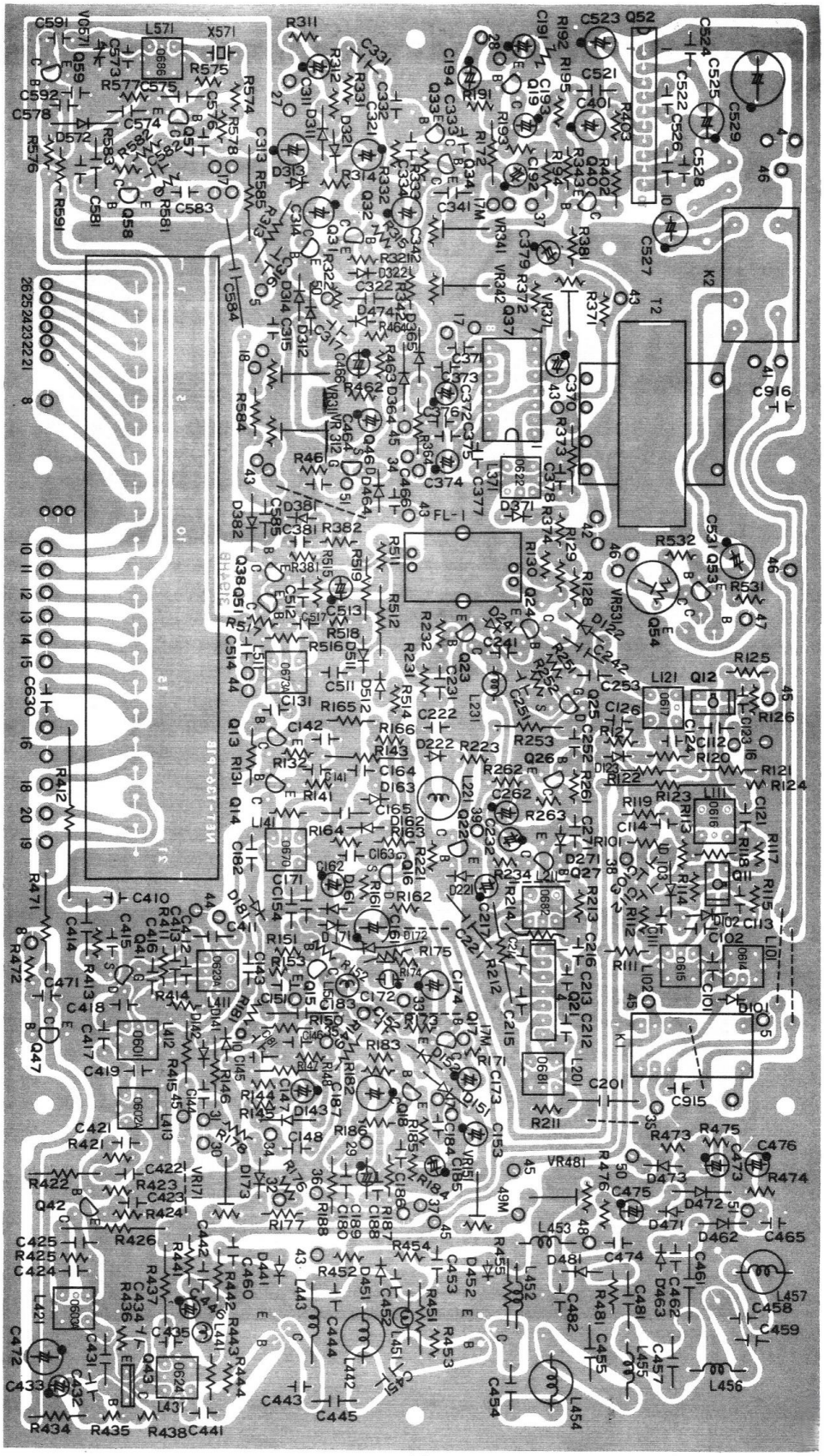
WIRING DIAGRAM



PARTS LAYOUT: MAIN BOARD (BOTTOM VIEW)

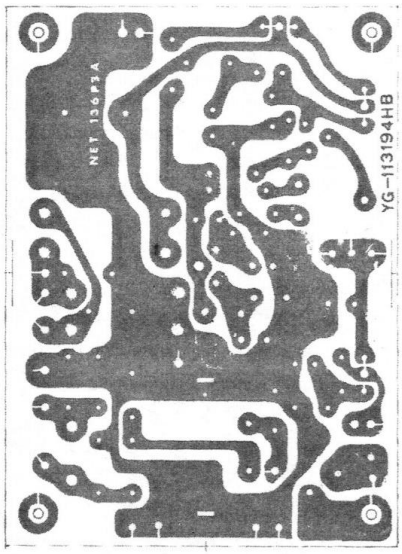


PARTS LAYOUT: MAIN BOARD (TOP VIEW)

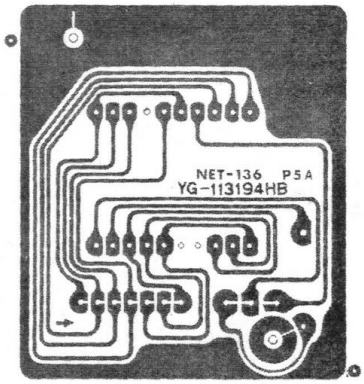


PARTS LAYOUT: SECONDARY BOARDS (BOTTOM VIEWS)

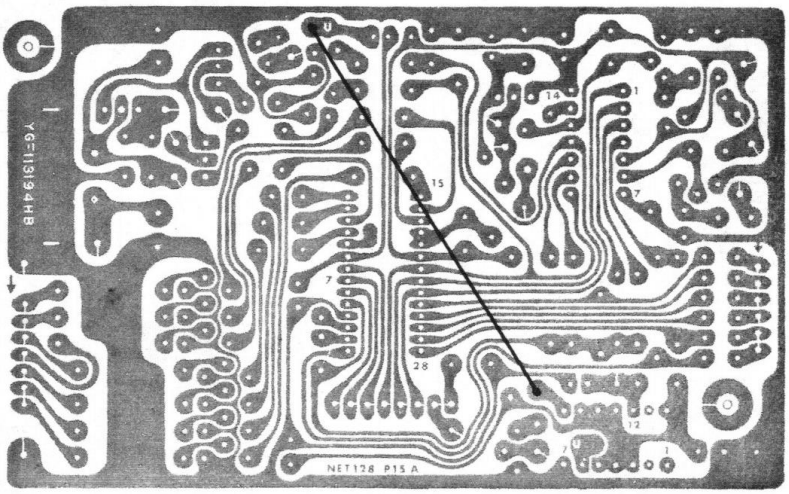
POWER SUPPLY



CHANNEL DISPLAY

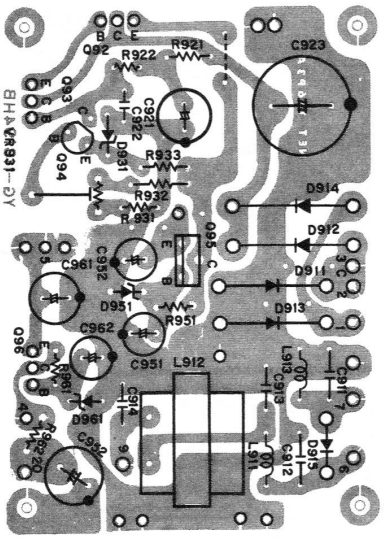


MICROPROCESSOR

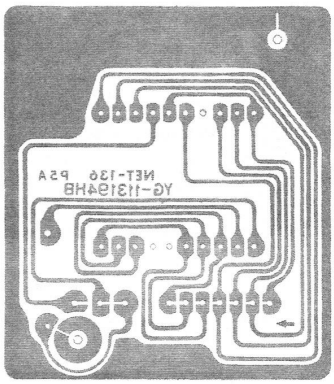


PARTS LAYOUT: SECONDARY BOARDS (TOP VIEW)

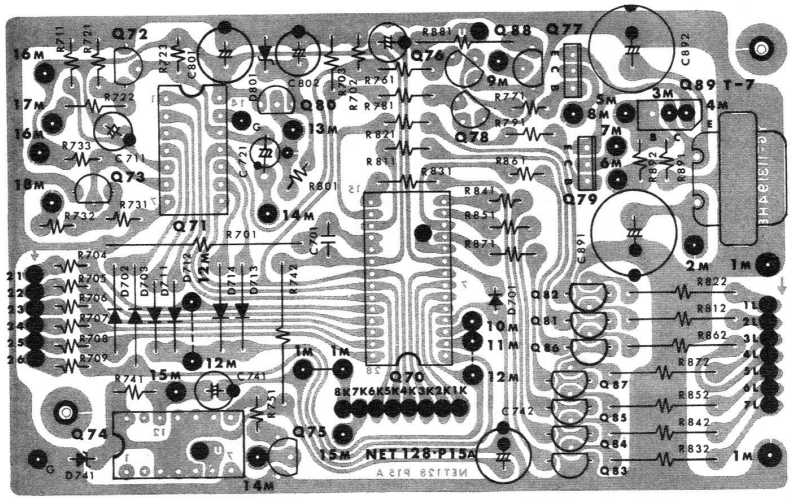
POWER SUPPLY



CHANNEL DISPLAY

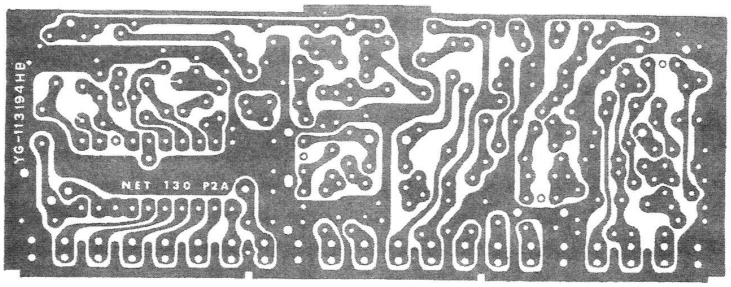


MICROPROCESSOR

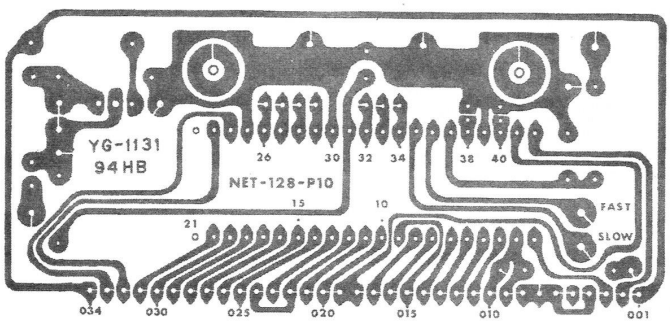


PARTS LAYOUT: SECONDARY BOARDS (BOTTOM VIEW)

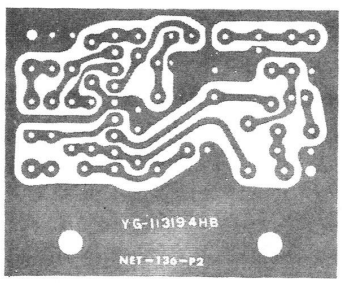
PLL CIRCUIT



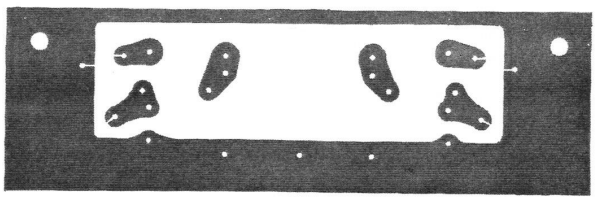
CLOCK CIRCUIT



MIC PRE-AMP

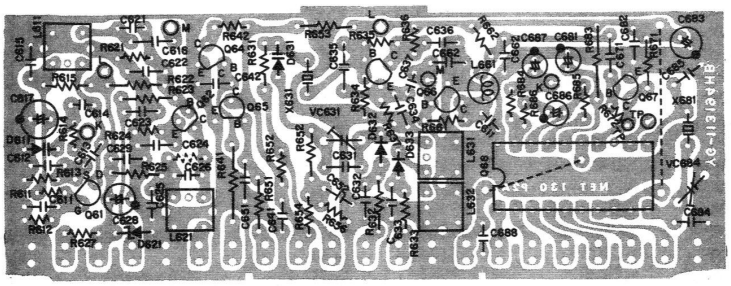


SWR BRIDGE

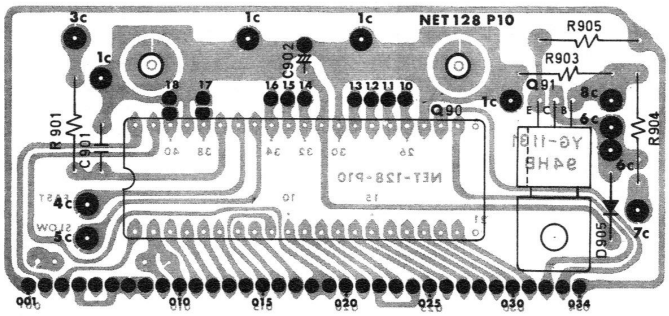


PARTS LAYOUT: SECONDARY BOARDS (TOP VIEW)

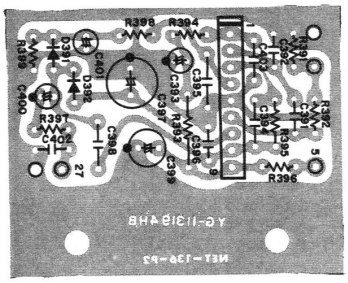
PLL CIRCUIT



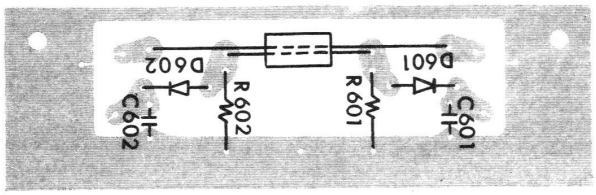
CLOCK CIRCUIT



MIC PRE-AMP



SWR BRIDGE



PARTS LIST

Reference Number	Description		Parts Number
Q11	MOS FET	3SK59	Q610513
	MOS FET	2SK73	Q610733
Q12	MOS FET	3SK59	Q610513
	MOS FET	3SK73	Q610733
Q13	Transistor	2SC1359	Q321323
	Transistor	2SC1675	Q331614
Q14	Transistor	2SC1359	Q321323
	Transistor	2SC1675	Q331614
Q15	Transistor	2SC1359	Q321323
	Transistor	2SC1675	Q331614
Q16	FET	2SK19	Q610115
Q17	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q18	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q19	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q21	IC	TA7061P	Q811370
Q22	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q23	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q24	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q25	FET	2SK19	Q610115
Q26	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q27	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q31	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q32	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q33	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q34	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q37	IC	SN76514	Q890168
Q38	Transistor	2SC1359	Q321323
	Transistor	2SC1675	Q331614
Q39	IC	TA7137P	Q811370
Q40	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q41	FET	2SK19	Q610115
Q42	Transistor	2SC1359	Q321323
	Transistor	2SC1675	Q331614
Q43	Transistor	2SC495 T	Q310431
Q44	Transistor	2SC1306K	Q331342
Q45	Transistor	2SC1307	Q331355
Q46	FET	2SK19	Q610115
Q47	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q51	Transistor	2SC1359	Q321323
	Transistor	2SC1675	Q331614
Q52	IC	TA7205	Q810151
Q53	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q54	Transistor	2SD235	Q410218
Q57	Transistor	2SC1359	Q321323
	Transistor	2SC1675	Q331614
Q58	Transistor	2SC1359	Q321323
	Transistor	2SC1675	Q331614
Q59	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q61	FET	2SK19	Q610115
Q62	Transistor	2SC1359	Q321323
	Transistor	2SC1675	Q331614
Q63	Transistor	2SC1359	Q321323
	Transistor	2SC1675	Q331614

Reference Number	Description		Parts Number
Q64	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q65	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q66	Transistor	2SC1359	Q321323
	Transistor	2SC1675	Q331614
Q67	Transistor	2SC1359	Q321323
	Transistor	2SC1675	Q331614
Q68	IC	LC7120	Q890223
Q70	IC	TMS1023NL	Q890207
Q71	IC	TP4016A	Q810164
Q72	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q73	Transistor	2SC1815	Q318158
Q73	Transistor	2SC828	Q320751
Q74	IC	SN7472	Q890171
Q75	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q76	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q77	Transistor	2SA496	Q110521
Q78	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q79	Transistor	2SA496	Q110521
Q80	Transistor	2SC1815	Q318158
Q80	Transistor	2SC828	Q320751
Q81	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q82	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q83	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q84	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q85	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q86	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q87	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q88	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q90	IC	TM4801P	Q890236
Q91	Transistor	2SC1096	Q331025
	Transistor	2SC1226	Q321213
Q92	Transistor	2SD586	Q410221
Q93	Transistor	2SD235	Q410218
Q94	Transistor	2SC1815	Q318158
	Transistor	2SC828	Q320751
Q95	Transistor	2SD235	Q410218
Q96	Transistor	2SD235	Q410218

TRANSISTORS, INTEGRATED CIRCUITS

Reference Number	Description		Parts Number
DIODES			
D101	Diode	1S1588	D010090
D102	Diode	1S1588	D010090
D103	Diode	1S1588	D010090
D122	Diode	1S1588	D010090
D123	Diode	1S1588	D010090
D141	Diode	1S1588	D010090
D142	Diode	1S1588	D010090
D143	Diode	1S1588	D010090
D151	Diode	1N60	D010045
D152	Diode	1N60	D010045
D161	Diode	1S1588	D010090
D162	Diode	1S1588	D010090
D163	Diode	1S1588	D010090
D171	Diode	1N60	D010045
D172	Diode	1N60	D010045
D173	Diode	1S1588	D010090
D174	Diode	1S1588	D010090
D181	Diode	1S1588	D010090
D221	Diode	1S1588	D010090
D222	Diode	1N60	D010045
D241	Diode	1S1588	D010090
D271	Diode	1S1588	D010090
D311	Diode	1S1588	D010090
D312	Diode	1S1588	D010090
D313	Zener Diode	WZ071	D160717
D314	Diode	1S1588	D010090
D321	Diode	1S1588	D010090
D322	Diode	1S1588	D010090
D364	Diode	1S1588	D010090
D365	Diode	1S1588	D010090
D371	Diode	1S1588	D010090
D381	Diode	1S1588	D010090
D382	Diode	1S1588	D010090
D391	Diode	1N60	D010045
D392	Diode	1N60	D010045
D441	Varistor	MVIY	D590031
D451	Diode	1S1588	D010090
D452	Varistor	MVIY	D590031
D462	Diode	1S1588	D010090
D463	Diode	1S1588	D010090
D464	Diode	1S1588	D010090
D471	Diode	1S1588	D010090
D472	Diode	1S1588	D010090
D473	Diode	1S1588	D010090
D474	Diode	1S1588	D010090
D481	Diode	1S1588	D010090
D511	Diode	1S1588	D010090
D512	Diode	1S1588	D010090
D572	Diode	1S1588	D010090
D601	Diode	1N60	D010045
D602	Diode	1N60	D010045
D603	Diode	1S1588	D010090
D611	Tuning Diode	1S2688	D260015
D621	Zener Diode	WZ071	D160717
D631	Tuning Diode	1S2688	D260015
D632	Diode	1S1588	D010090
D633	Diode	1S1588	D010090
D701	Diode	1S1588	D010090
D713	Diode	1S1588	D010090
D714	Diode	1S1588	D010090
D741	Zener Diode	WZ050	D160131
D801	Zener Diode	WZ096	D160966
D810	LED (Channel Ind.)	SL1260-01	D390066
D901	LED (Clock Ind.)	TLR2037	D310075
D907	LED	TLR103	D310091
D908	LED	TLG103	D310088
D911	Diode	S3V10	D093101
D912	Diode	S3V10	D093101
D913	Diode	S3V10	D093101
D914	Diode	S3V10	D093101
D915	Diode	S3V10	D093101
D931	Zener Diode	WZ071	D160717
D951	Zener Diode	WZ096	D160966
D961	Zener Diode	WZ096	D160966

Reference Number	Description			Parts Number
CAPACITORS				
C101	Ceramic	3pF	50V	C040031
C102	Ceramic	0.001uF	50V	C040303
C103	Ceramic	0.01uF	50V	C040361
C111	Ceramic	0.01uF	50V	C040361
C112	Ceramic	0.01uF	50V	C040361
C113	Ceramic	0.01uF	50V	C040361
C114	Ceramic	0.01uF	50V	C040361
C121	Ceramic	270pF	50V	C040251
C122	Ceramic	0.001uF	50V	C040303
C123	Ceramic	0.01uF	50V	C040361
C124	Ceramic	0.01uF	50V	C040361
C126	Ceramic	0.01uF	50V	C040361
C131	Ceramic	0.01uF	50V	C040361
C141	Ceramic	0.01uF	50V	C040361
C142	Ceramic	0.01uF	50V	C040361
C143	Ceramic	47pF	50V	C040167
C144	Ceramic	0.01uF	50V	C040361
C145	Polyester film	0.0047uF	50V	C440068
C146	Polyester film	0.001uF	50V	C440013
C147	Electrolytic	47uF	10V	C610050
C148	Ceramic	0.1uF	50V	C040439
C149	Ceramic	47pF	50V	C040167
C151	Ceramic	0.01uF	50V	C040361
C152	Ceramic	0.01uF	50V	C040361
C153	Electrolytic	1uF	50V	C640020
C154	Ceramic	2pF	50V	C040028
C161	Electrolytic	47uF	10V	C610050
C162	Electrolytic	47uF	10V	C610050
C163	Ceramic	0.01uF	50V	C040361
C164	Ceramic	0.01uF	50V	C040361
C165	Ceramic	22pF	50V	C040138
C171	Ceramic	0.01uF	50V	C040361
C172	Electrolytic	47uF	10V	C610050
C173	Electrolytic	4.7uF	10V	C630108
C174	Electrolytic	4.7uF	10V	C630108
C175	Ceramic	0.01uF	50V	C040361
C180	Polyester film	0.039uF	50V	C443971
C181	Ceramic	0.01uF	50V	C040361
C182	Ceramic	5pF	50V	C040057
C183	Ceramic	330pF	50V	C040264
C184	Ceramic	0.01uF	50V	C040361
C185	Electrolytic	10uF	10V	C610018
C186	Ceramic	0.01uF	50V	C040361
C187	Electrolytic	10uF	16V	C620079
C188	Polyester film	0.0047uF	50V	C440068
C189	Electrolytic	0.47uF	50V	C440246
C191	Electrolytic	10uF	10V	C610018
C192	Electrolytic	10uF	10V	C610018
C193	Electrolytic	10uF	10V	C610018
C194	Electrolytic	0.47uF	50V	C640017
C201	Silvered Mica	47pF	50V	C140258
C212	Ceramic	0.047uF	50V	C040413
C213	Ceramic	0.047uF	50V	C040413
C214	Ceramic	0.047uF	50V	C040413
C215	Ceramic	0.047uF	50V	C040413
C216	Ceramic	0.047uF	50V	C040413
C217	Electrolytic	10uF	16V	C720018
C221	Ceramic	0.001uF	50V	C040303
C222	Ceramic	270pF	50V	C040251
C231	Polyester film	0.0033uF	50V	C440055

Reference Number	Description			Parts Number
C232	Electrolytic	10uF	16V	C620079
C241	Ceramic	0.01uF	50V	C040361
C242	Ceramic	0.01uF	50V	C040361
C243	Ceramic	10pF	50V	C040099
C251	Ceramic	0.01uF	50V	C040361
C252	Ceramic	0.01uF	50V	C040361
C262	Electrolytic	10uF	10V	C610018
C271	Ceramic	100pF	50V	C040206
C311	Electrolytic	1uF	50V	C640020
C312	Ceramic	0.01uF	50V	C040361
C313	Electrolytic	100uF	10V	C610089
C314	Electrolytic	100uF	10V	C610089
C315	Ceramic	0.01uF	50V	C040361
C316	Ceramic	0.01uF	50V	C040361
C317	Ceramic	0.1uF	50V	C040439
C321	Electrolytic	4.7uF	50V	C640046
C322	Polyester film	0.1uF	50V	C440181
C331	Polyester film	0.1uF	50V	C440181
C332	Polyester film	0.0047uF	50V	C440068
C333	Ceramic	0.01uF	50V	C040361
C334	Polyester film	0.001uF	50V	C440013
C341	Ceramic	0.01uF	50V	C040361
C342	Electrolytic	100uF	10V	C610089
C370	Electrolytic	10uF	10V	C610018
C371	Ceramic	7pF	50V	C040073
C372	Electrolytic	10uF	10V	C610018
C373	Ceramic	0.01uF	50V	C040361
C374	Electrolytic	10uF	10V	C610018
C375	Ceramic	0.01uF	50V	C040361
C376	Ceramic	0.01uF	50V	C040361
C377	Ceramic	0.01uF	50V	C040361
C378	Ceramic	0.01uF	50V	C040361
C379	Electrolytic	47uF	10V	C610050
C381	Ceramic	0.01uF	50V	C040361
C391	Polyester film	0.022uF	50V	C440110
C392	Ceramic	0.001uF	50V	C040303
C393	Electrolytic	10uF	16V	C620079
C394	Ceramic	56pF	50V	C040183
C395	Polyester film	0.1uF	50V	C440181
C396	Ceramic	0.01uF	50V	C040361
C397	Electrolytic	330uF	6.3V	C600109
C398	Ceramic	0.1uF	50V	C040439
C399	Electrolytic	100uF	10V	C610089
C400	Electrolytic	0.47uF	50V	C640017
C401	Electrolytic	1uF	50V	C640020
C402	Polyester film	0.022uF	50V	C440110
C403	Polyester film	0.01uF	50V	C440097
C404	Electrolytic	1uF	50V	C640020
C410	Ceramic	22pF	50V	C040138
C411	Ceramic	3pF	50V	C040031
C412	Silvered Mica	100pF	50V	C040206
C413	Ceramic	0.01uF	50V	C040361
C414	Ceramic	47pF	50V	C040167
C415	Ceramic	150pF	50V	C040222
C416	Ceramic	0.01uF	50V	C040361
C417	Ceramic	3pF	50V	C040031
C418	Silvered Mica	100pF	50V	C140342
C419	Silvered Mica	100pF	50V	C140342
C421	Ceramic	0.01uF	50V	C040361
C422	Ceramic	0.01uF	50V	C040361
C423	Ceramic	0.01uF	50V	C040361
C424	Silvered Mica	100pF	50V	C140342
C425	Ceramic	0.01uF	50V	C040361
C431	Ceramic	220pF	50V	C140423
C432	Ceramic	0.01uF	50V	C040361
C433	Electrolytic	10uF	10V	C610018
C434	Ceramic	0.01uF	50V	C040361
C435	Ceramic	0.01uF	50V	C040361
C441	Ceramic	220pF	50V	C040248
C442	Ceramic	0.01uF	50V	C040361

Reference Number	Description			Parts Number
C443	Silvered Mica	100pF	50V	C140342
C444	Ceramic	0.01uF	50V	C040361
C445	Silvered Mica	68pF	50V	C140300
C446	Electrolytic	33uF	10V	C610047
C451	Silvered Mica	150pF	50V	C140384
C452	Ceramic	0.01uF	50V	C040361
C453	Ceramic	0.1uF	50V	C040439
C454	Silvered Mica	330pF	50V	C140478
C455	Silvered Mica	680pF	50V	C140610
C457	Silvered Mica	270pF	50V	C140452
C458	Silvered Mica	47pF	50V	C140258
C459	Silvered Mica	68pF	50V	C140300
C460	Ceramic	0.1uF	50V	C040439
C461	Ceramic	1pF	50V	C040015
C462	Ceramic	3pF	50V	C040031
C463	Ceramic	0.01uF	50V	C040361
C464	Electrolytic	1uF	50V	C640020
C465	Ceramic	0.047uF	50V	C040413
C466	Electrolytic	1uF	50V	C640020
C471	Ceramic	0.01uF	50V	C040361
C472	Electrolytic	10uF	16V	C620079
C473	Electrolytic	1uF	50V	C640020
C474	Ceramic	0.01uF	50V	C040361
C475	Electrolytic	10uF	16V	C620079
C476	Electrolytic	1uF	50V	C640020
C481	Ceramic	3pF	50V	C040031
C482	Ceramic	0.1uF	50V	C040439
C511	Ceramic	0.01uF	50V	C040361
C512	Ceramic	0.01uF	50V	C040361
C513	Electrolytic	10uF	10V	C610018
C514	Ceramic	22pF	50V	C040138
C517	Ceramic	0.01uF	50V	C040361
C521	Ceramic	0.01uF	50V	C040361
C522	Ceramic	270pF	50V	C040251
C523	Electrolytic	47uF	10V	C610050
C524	Polyester film	0.068uF	50V	C440178
C525	Electrolytic	47uF	10V	C610050
C526	Ceramic	180pF	50V	C040235
C527	Electrolytic	220uF	16V	C620150
C528	Polyester film	0.068uF	50V	C440178
C529	Electrolytic	2200uF	16V	C720157
C531	Electrolytic	10uF	16V	C620079
C541	Electrolytic	470uF	16V	C620176
C573	Silvered Mica	7pF	50V	C140054
C574	Silvered Mica	150pF	50V	C140384
C575	Silvered Mica	330pF	50V	C140478
C576	Ceramic	0.01uF	50V	C040361
C578	Ceramic	0.01uF	50V	C040361
C581	Ceramic	3pF	50V	C040031
C582	Ceramic	0.01uF	50V	C040361
C583	Ceramic	47pF	50V	C040167
C584	Ceramic	5pF	50V	C040057
C585	Ceramic	22pF	50V	C040138
C591	Ceramic	0.01uF	50V	C040361
C592	Ceramic	0.01uF	50V	C040361
C601	Ceramic	0.01uF	50V	C040361
C602	Ceramic	0.01uF	50V	C040361
C603	Ceramic	0.01uF	50V	C040361
C611	Ceramic	0.01uF	50V	C040361
C612	Silvered Mica	220pF	50V	C140423
C613	Silvered Mica	22pF	50V	C140148
C614	Silvered Mica	47pF	50V	C140258
C615	Ceramic	0.01uF	50V	C040361
C616	Ceramic	3pF	50V	C040031
C617	Electrolytic	47uF	16V	C620105
C621	Ceramic	22pF	50V	C040138
C622	Ceramic	220pF	50V	C040248
C623	Ceramic	0.01uF	50V	C040361
C624	Ceramic	0.01uF	50V	C040361
C625	Ceramic	0.01uF	50V	C040361

Reference Number	Description			Parts Number
C626	Silvered Mica	39pF	50V	C140229
C628	Electrolytic	47uF	10V	C610050
C629	Ceramic	0.01uF	50V	C040361
C630	Ceramic	0.01uF	50V	C040361
C631	Silvered Mica	12pF	50V	C140083
C632	Ceramic	0.01uF	50V	C040361
C633	Ceramic	0.01uF	50V	C040361
C634	Silvered Mica	150pF	50V	C140384
C635	Silvered Mica	330pF	50V	C140478
C636	Ceramic	0.01uF	50V	C040361
C637	Ceramic	3pF	50V	C040031
C641	Ceramic	0.01uF	50V	C040361
C642	Ceramic	0.01uF	50V	C040361
C651	Ceramic	0.01uF	50V	C040361
C652	Ceramic	0.01uF	50V	C040361
C661	Ceramic	47pF	50V	C040167
C662	Ceramic	33pF	50V	C040154
C671	Ceramic	0.01uF	50V	C040361
C672	Ceramic	47pF	50V	C040167
C681	Tantalum	0.1uF	25V	C530198
C682	Ceramic	0.01uF	50V	C040361
C683	Electrolytic	33uF	10V	C610047
C684	Silvered Mica	22pF	50V	C140148
C685	Silvered Mica	100pF	50V	C140342
C686	Tantalum	1uF	25V	C530017
C687	Tantalum	0.1uF	25V	C530198
C688	Ceramic	0.01uF	50V	C040361
C701	Ceramic	56pF	50V	C040183
C702	Electrolytic	1uF	50V	C640020
C721	Electrolytic	33uF	10V	C610047
C741	Electrolytic	10uF	10V	C610018
C742	Electrolytic	100uF	10V	C610089
C801	Electrolytic	100uF	10V	C610089
C802	Electrolytic	47uF	16V	C620105
C891	Electrolytic	1000uF	16V	C620202
C892	Electrolytic	1000uF	16V	C620202
C901	Ceramic	560pF	50V	C040280
C902	Electrolytic	100uF	16V	C620134
C911	Ceramic	0.01uF	50V	C040361
C912	Ceramic	0.01uF	50V	C040361
C913	Ceramic	0.01uF	50V	C040361
C914	Ceramic	0.01uF	50V	C040361
C915	Ceramic	0.01uF	50V	C040361
C916	Ceramic	0.01uF	50V	C040361
C917	Ceramic	0.001uF	500V	C070302
C918	Ceramic	0.001uF	500V	C070302
C919	Ceramic	0.001uF	50V	C040303
C920	Ceramic	0.001uF	50V	C040303
C921	Electrolytic	220uF	25V	C631013
C922	Ceramic	0.1uF	50V	C040439
C923	Electrolytic	3300uF	25V	C633325
C951	Electrolytic	47uF	10V	C610050
C952	Electrolytic	100uF	10V	C610089
C961	Electrolytic	100uF	10V	C610089
C962	Electrolytic	47uF	10V	C610050
C963	Electrolytic	1000uF	16V	C620202
C991	Ceramic	0.001uF	50V	C040303
C992	Ceramic	0.001uF	50V	C040303
C993	Ceramic	0.001uF	50V	C040303
C994	Ceramic	0.001uF	50V	C040303
C996	Ceramic	0.001uF	50V	C040303
C997	Ceramic	0.001uF	50V	C040303

VARIABLE CAPACITORS

VC571	Variable capacitor 20pF	C890089
VC631	Variable capacitor 10pF	C890045
VC681	Variable capacitor 20pF	C890089

Reference Number	Description	Parts Number
RESISTORS		
R100	Carbon resistor ¼W 1KΩ 10%	R011028
R101	Carbon resistor ¼W 1.8KΩ 10%	R011824
R111	Carbon resistor ¼W 47KΩ 10%	R014737
R112	Carbon resistor ¼W 150KΩ 10%	R011549
R113	Carbon resistor ¼W 5.6KΩ 10%	R015626
R114	Carbon resistor ¼W 8.2KΩ 10%	R018225
R115	Carbon resistor ¼W 470Ω 10%	R014711
R117	Carbon resistor ¼W 220Ω 10%	R012218
R118	Carbon resistor ¼W 2.2KΩ 10%	R012221
R119	Carbon resistor ¼W 560Ω 10%	R015613
R120	Carbon resistor ¼W 330Ω 10%	R013314
R121	Carbon resistor ¼W 10KΩ 10%	R011031
R122	Carbon resistor ¼W 39KΩ 10%	R013932
R123	Carbon resistor ¼W 390KΩ 10%	R003942
R124	Carbon resistor ¼W 270KΩ 10%	R012742
R125	Carbon resistor ¼W 1KΩ 10%	R011028
R126	Carbon resistor ¼W 560Ω 10%	R015613
R127	Carbon resistor ¼W 3.3KΩ 10%	R013327
R128	Carbon resistor ¼W 220Ω 10%	R012218
R129	Carbon resistor ¼W 220Ω 10%	R012218
R130	Carbon resistor ¼W 1KΩ 10%	R011028
R131	Carbon resistor ¼W 47KΩ 10%	R014737
R132	Carbon resistor ¼W 2.2KΩ 10%	R012221
R141	Carbon resistor ¼W 330Ω 10%	R013314
R143	Carbon resistor ¼W 100Ω 10%	R011015
R144	Carbon resistor ¼W 56KΩ 10%	R015639
R145	Carbon resistor ¼W 56KΩ 10%	R015639
R146	Carbon resistor ¼W 15KΩ 10%	R011536
R147	Carbon resistor ¼W 22KΩ 10%	R012234
R148	Carbon resistor ¼W 39KΩ 10%	R013932
R149	Carbon resistor ¼W 47KΩ 10%	R014737
R150	Carbon resistor ¼W 100KΩ 10%	R011044
R151	Carbon resistor ¼W 100KΩ 10%	R011044
R152	Carbon resistor ¼W 220KΩ 10%	R012247
R153	Carbon resistor ¼W 470Ω 10%	R014711
R161	Carbon resistor ¼W 2.2KΩ 10%	R012221
R162	Carbon resistor ¼W 8.2KΩ 10%	R018225
R163	Carbon resistor ¼W 4.7MΩ 10%	R014753
R164	Carbon resistor ¼W 1MΩ 10%	R011057
R165	Carbon resistor ¼W 4.7KΩ 10%	R014724
R166	Carbon resistor ¼W 18KΩ 10%	R011837
R171	Carbon resistor ¼W 18KΩ 10%	R011837
R172	Carbon resistor ¼W 10KΩ 10%	R011031
R173	Carbon resistor ¼W 1KΩ 10%	R011028
R174	Carbon resistor ¼W 12KΩ 10%	R011235
R175	Carbon resistor ¼W 3.3KΩ 10%	R013327
R176	Carbon resistor ¼W 1KΩ 10%	R011028
R177	Carbon resistor ¼W 56KΩ 10%	R015639
R178	Carbon resistor ¼W 560KΩ 10%	R015642
R179	Carbon resistor ¼W 15KΩ 10%	R001533
R181	Carbon resistor ¼W 4.7KΩ 10%	R014724
R182	Carbon resistor ¼W 100KΩ 10%	R011044
R183	Carbon resistor ¼W 10KΩ 10%	R011031
R184	Carbon resistor ¼W 1KΩ 10%	R011028
R185	Carbon resistor ¼W 220Ω 10%	R012218
R186	Carbon resistor ¼W 3.3KΩ 10%	R013327
R187	Carbon resistor ¼W 4.7KΩ 10%	R014724
R188	Carbon resistor ¼W 220Ω 10%	R011028
R191	Carbon resistor ¼W 6.8KΩ 10%	R016829
R192	Carbon resistor ¼W 1KΩ 10%	R011028
R193	Carbon resistor ¼W 3.3KΩ 10%	R013327
R194	Carbon resistor ¼W 1KΩ 10%	R011028
R195	Carbon resistor ¼W 22KΩ 10%	R012234
R211	Carbon resistor ¼W 10KΩ 10%	R011031
R212	Carbon resistor ¼W 330Ω 10%	R013314
R213	Carbon resistor ¼W 330Ω 10%	R013314
R214	Carbon resistor ¼W 2.2KΩ 10%	R012221

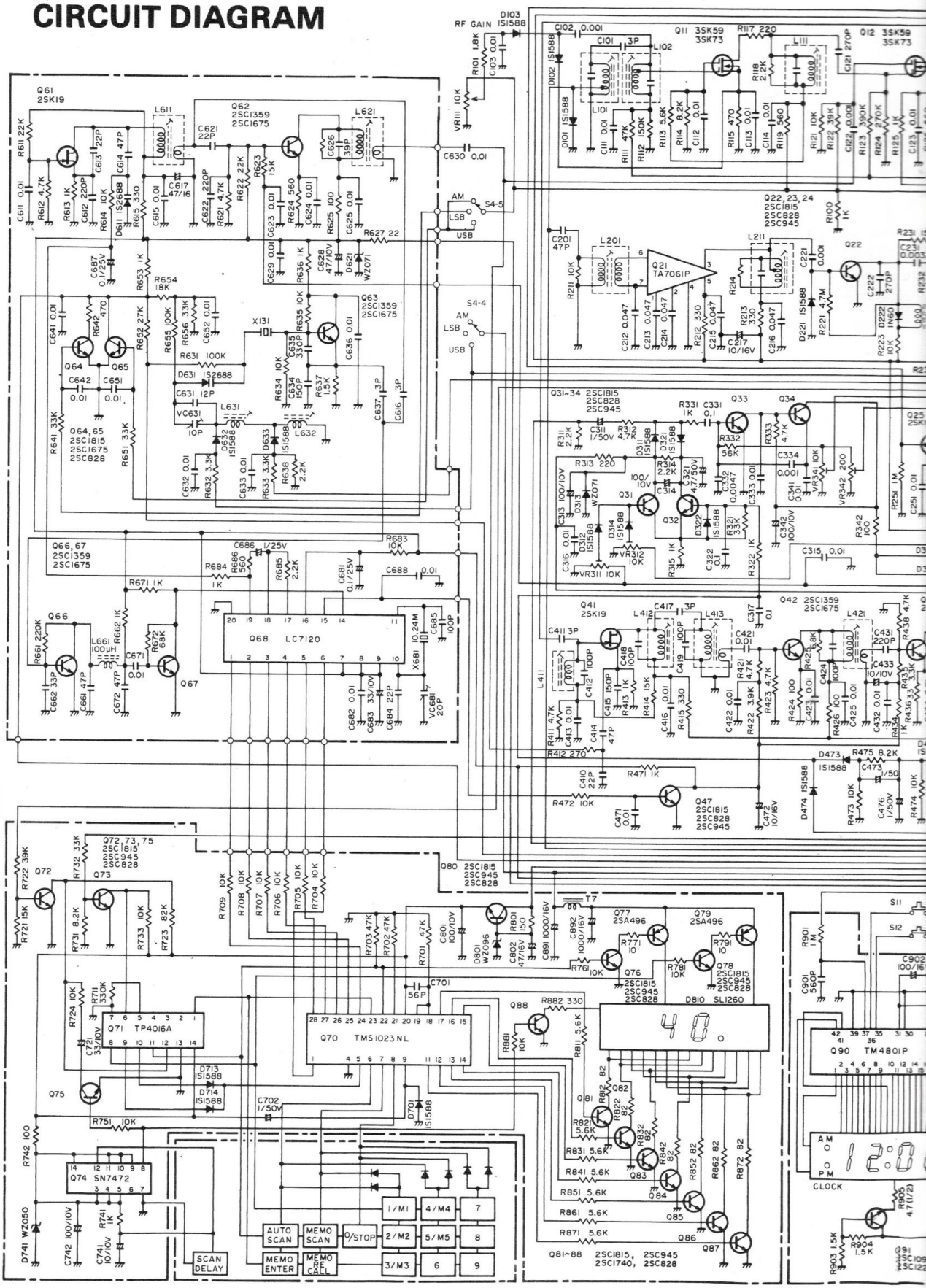
Reference Number	Description	Parts Number
R221	Carbon resistor ¼W 4.7MΩ 10%	R014753
R223	Carbon resistor ¼W 10KΩ 10%	R011031
R231	Carbon resistor ¼W 150KΩ 10%	R021542
R232	Carbon resistor ¼W 68KΩ 10%	R016832
R233	Carbon resistor ¼W 1.2KΩ 10%	R011222
R234	Carbon resistor ¼W 1KΩ 10%	R011028
R251	Carbon resistor ¼W 1MΩ 10%	R011057
R252	Carbon resistor ¼W 100Ω 10%	R011015
R253	Carbon resistor ¼W 330Ω 10%	R013314
R261	Carbon resistor ¼W 180KΩ 10%	R011840
R262	Carbon resistor ¼W 2.2KΩ 10%	R012221
R263	Carbon resistor ¼W 1.5KΩ 10%	R011523
R311	Carbon resistor ¼W 2.2KΩ 10%	R012221
R312	Carbon resistor ¼W 4.7KΩ 10%	R014724
R313	Carbon resistor ¼W 220Ω 10%	R012218
R314	Carbon resistor ¼W 2.2KΩ 10%	R012221
R315	Carbon resistor ¼W 1KΩ 10%	R011028
R321	Carbon resistor ¼W 33KΩ 10%	R013330
R322	Carbon resistor ¼W 1KΩ 10%	R011028
R331	Carbon resistor ¼W 1KΩ 10%	R011028
R332	Carbon resistor ¼W 56KΩ 10%	R015639
R333	Carbon resistor ¼W 4.7KΩ 10%	R014724
R342	Carbon resistor ¼W 100Ω 10%	R011015
R343	Carbon resistor ¼W 22KΩ 10%	R012234
R364	Carbon resistor ¼W 470Ω 10%	R014711
R371	Carbon resistor ¼W 56KΩ 10%	R015639
R372	Carbon resistor ¼W 22KΩ 10%	R012234
R373	Carbon resistor ¼W 1KΩ 10%	R011028
R374	Carbon resistor ¼W 220Ω 10%	R012218
R381	Carbon resistor ¼W 4.7KΩ 10%	R014724
R382	Carbon resistor ¼W 4.7KΩ 10%	R014724
R391	Carbon resistor ¼W 680Ω 10%	R016816
R392	Carbon resistor ¼W 5.6KΩ 10%	R015626
R393	Carbon resistor ¼W 12KΩ 10%	R001232
R394	Carbon resistor ¼W 27KΩ 10%	R012739
R395	Carbon resistor ¼W 100KΩ 10%	R011044
R396	Carbon resistor ¼W 2.2KΩ 10%	R012221
R397	Carbon resistor ¼W 8.2KΩ 10%	R018225
R398	Carbon resistor ¼W 2.7KΩ 10%	R012726
R399	Carbon resistor ¼W 470KΩ 10%	R014740
R401	Carbon resistor ¼W 10KΩ 10%	R011031
R402	Carbon resistor ¼W 10KΩ 10%	R011031
R403	Carbon resistor ¼W 330Ω 10%	R013314
R411	Carbon resistor ¼W 4.7KΩ 10%	R014724
R412	Carbon resistor ¼W 270Ω 10%	R002710
R413	Carbon resistor ¼W 1KΩ 10%	R011028
R414	Carbon resistor ¼W 15KΩ 10%	R011536
R415	Carbon resistor ¼W 330Ω 10%	R013314
R421	Carbon resistor ¼W 4.7KΩ 10%	R014724
R422	Carbon resistor ¼W 3.9KΩ 10%	R013929
R423	Carbon resistor ¼W 4.7KΩ 10%	R014724
R424	Carbon resistor ¼W 100Ω 10%	R011015
R425	Carbon resistor ¼W 6.8KΩ 10%	R016829
R426	Carbon resistor ¼W 100Ω 10%	R001012
R434	Carbon resistor ¼W 1KΩ 10%	R001025
R435	Carbon resistor ¼W 3.3KΩ 10%	R013327
R436	Carbon resistor ¼W 33Ω 10%	R013301
R437	Carbon resistor ¼W 10Ω 10%	R001009
R438	Carbon resistor ¼W 4.7KΩ 10%	R014724
R441	Carbon resistor ¼W 820Ω 10%	R018212
R442	Carbon resistor ¼W 10Ω 10%	R011002
R443	Carbon resistor ¼W 33Ω 10%	R013301
R444	Carbon resistor ¼W 1KΩ 10%	R011028
R451	Carbon resistor ¼W 15Ω 10%	R001504
R452	Carbon resistor ¼W 270Ω 10%	R012713
R453	Carbon resistor ¼W 27Ω 10%	R012700
R454	Carbon resistor ¼W 4.7Ω 10%	R014795
R455	Carbon resistor ¼W 560Ω 10%	R005610
R461	Carbon resistor ¼W 1MΩ 10%	R011057
R462	Carbon resistor ¼W 6.8KΩ 10%	R016829
R463	Carbon resistor ¼W 8.2KΩ 10%	R018225
R464	Carbon resistor ¼W 10KΩ 10%	R011031
R471	Carbon resistor ¼W 1KΩ 10%	R011028
R472	Carbon resistor ¼W 10KΩ 10%	R011031
R473	Carbon resistor ¼W 10KΩ 10%	R011031
R474	Carbon resistor ¼W 10KΩ 10%	R011031
R475	Carbon resistor ¼W 8.2KΩ 10%	R018225
R476	Carbon resistor ¼W 100Ω 10%	R011015
R481	Carbon resistor ¼W 470Ω 10%	R014711
R511	Carbon resistor ¼W 470Ω 10%	R014711
R512	Carbon resistor ¼W 680Ω 10%	R016816
R514	Carbon resistor ¼W 22KΩ 10%	R012234
R515	Carbon resistor ¼W 560Ω 10%	R015613
R516	Carbon resistor ¼W 18KΩ 10%	R011837
R517	Carbon resistor ¼W 560Ω 10%	R015613
R518	Carbon resistor ¼W 10KΩ 10%	R011031
R519	Carbon resistor ¼W 33KΩ 10%	R013330
R531	Carbon resistor ¼W 390Ω 10%	R013916
R532	Carbon resistor ¼W 220Ω 10%	R012218
R574	Carbon resistor ¼W 10KΩ 10%	R011031
R575	Carbon resistor ¼W 10KΩ 10%	R011031
R576	Carbon resistor ¼W 3.3KΩ 10%	R013327
R577	Carbon resistor ¼W 1.5KΩ 10%	R011523
R578	Carbon resistor ¼W 470Ω 10%	R014711
R581	Carbon resistor ¼W 1KΩ 10%	R011028
R582	Carbon resistor ¼W 470Ω 10%	R014711
R583	Carbon resistor ¼W 220KΩ 10%	R012247
R584	Carbon resistor ¼W 22KΩ 10%	R012234
R585	Carbon resistor ¼W 120Ω 10%	R011219
R591	Carbon resistor ¼W 33KΩ 10%	R013330
R601	Carbon resistor ¼W 680Ω 10%	R016816
R602	Carbon resistor ¼W 680Ω 10%	R016816
R611	Carbon resistor ¼W 22KΩ 10%	R012234
R612	Carbon resistor ¼W 4.7KΩ 10%	R014724
R613	Carbon resistor ¼W 1KΩ 10%	R011028
R614	Carbon resistor ¼W 10KΩ 10%	R001038
R615	Carbon resistor ¼W 330Ω 10%	R013314
R621	Carbon resistor ¼W 4.7KΩ 10%	R014724
R622	Carbon resistor ¼W 22KΩ 10%	R012234
R623	Carbon resistor ¼W 15KΩ 10%	R011536
R624	Carbon resistor ¼W 560Ω 10%	R015613
R625	Carbon resistor ¼W 100Ω 10%	R011015
R627	Carbon resistor ¼W 22Ω 10%	R012205
R631	Carbon resistor ¼W 100KΩ 10%	R011044
R632	Carbon resistor ¼W 3.3KΩ 10%	R013327
R633	Carbon resistor ¼W 3.3KΩ 10%	R013327
R634	Carbon resistor ¼W 10KΩ 10%	R011031
R635	Carbon resistor ¼W 10KΩ 10%	R011031
R636	Carbon resistor ¼W 1KΩ 10%	R011028
R637	Carbon resistor ¼W 1.5KΩ 10%	R001520
R638	Carbon resistor ¼W 2.2KΩ 10%	R012221
R641	Carbon resistor ¼W 33KΩ 10%	R013330
R642	Carbon resistor ¼W 470Ω 10%	R014711
R651	Carbon resistor ¼W 33KΩ 10%	R013330
R652	Carbon resistor ¼W 27KΩ 10%	R012739
R653	Carbon resistor ¼W 1KΩ 10%	R011028
R654	Carbon resistor ¼W 18KΩ 10%	R011837
R655	Carbon resistor ¼W 100KΩ 10%	R011044
R656	Carbon resistor ¼W 33KΩ 10%	R013330
R661	Carbon resistor ¼W 220KΩ 10%	R012247
R662	Carbon resistor ¼W 1KΩ 10%	R011028
R671	Carbon resistor ¼W 1KΩ 10%	R001025
R672	Carbon resistor ¼W 68KΩ 10%	R016832
R683	Carbon resistor ¼W 10KΩ 10%	R011031
R684	Carbon resistor ¼W 1KΩ 10%	R011028
R685	Carbon resistor ¼W 2.2KΩ 10%	R012221
R686	Carbon resistor ¼W 560Ω 10%	R005610
R701	Carbon resistor ¼W 47KΩ 10%	R004734

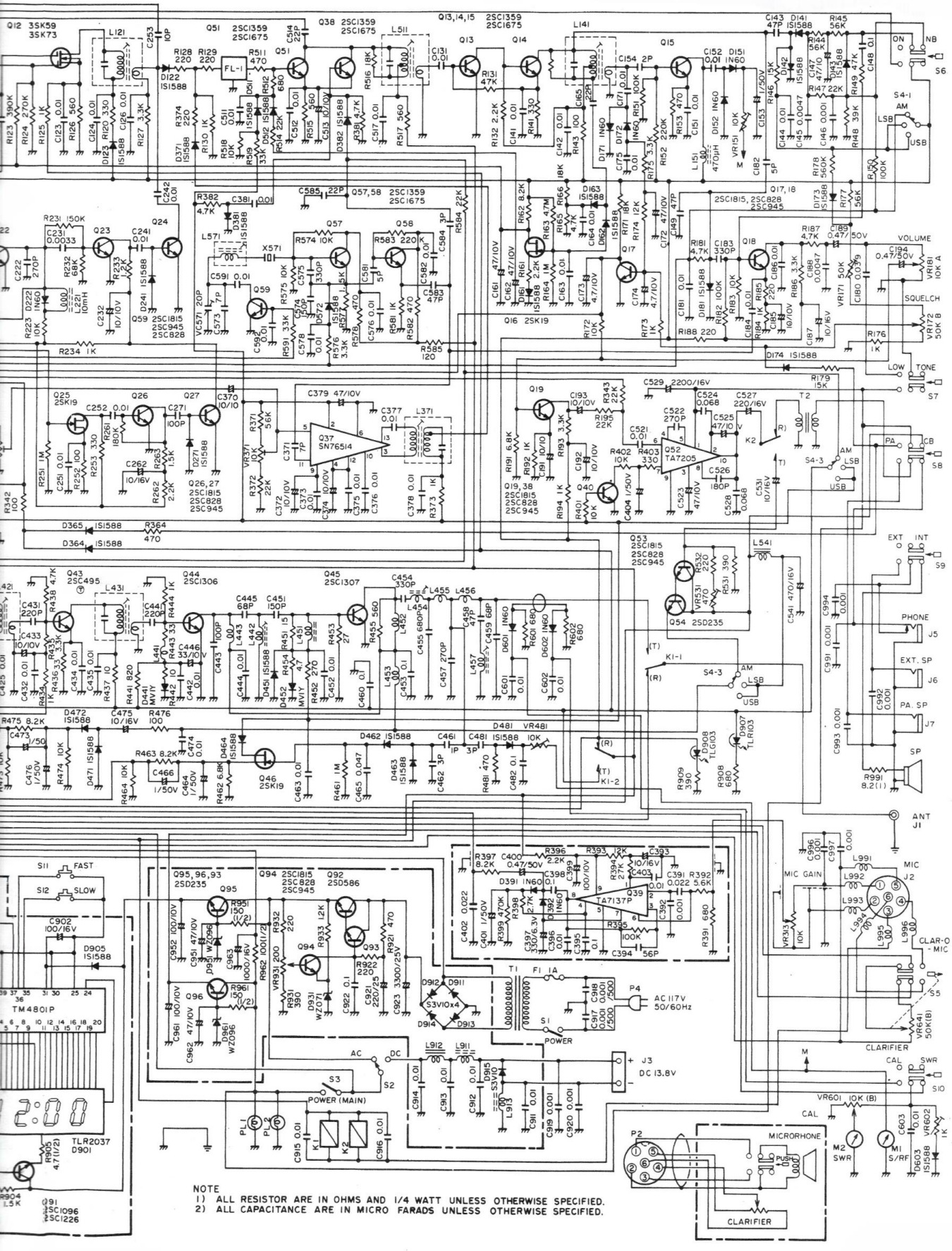
Reference Number	Description	Parts Number
R702	Carbon resistor ¼W 47KΩ 10%	R004734
R703	Carbon resistor ¼W 47KΩ 10%	R004734
R704	Carbon resistor ¼W 10KΩ 10%	R011031
R705	Carbon resistor ¼W 10KΩ 10%	R011031
R706	Carbon resistor ¼W 10KΩ 10%	R011031
R707	Carbon resistor ¼W 10KΩ 10%	R011031
R708	Carbon resistor ¼W 10KΩ 10%	R011031
R709	Carbon resistor ¼W 10KΩ 10%	R011031
R711	Carbon resistor ¼W 330KΩ 10%	R013343
R721	Carbon resistor ¼W 15KΩ 10%	R011536
R722	Carbon resistor ¼W 39KΩ 10%	R013932
R723	Carbon resistor ¼W 82KΩ 10%	R018238
R724	Carbon resistor ¼W 10KΩ 10%	R001038
R731	Carbon resistor ¼W 8.2KΩ 10%	R018225
R732	Carbon resistor ¼W 33KΩ 10%	R013330
R733	Carbon resistor ¼W 10KΩ 10%	R011031
R741	Carbon resistor ¼W 1KΩ 10%	R011028
R742	Carbon resistor ¼W 100Ω 10%	R011015
R751	Carbon resistor ¼W 10KΩ 10%	R011031
R761	Carbon resistor ¼W 100Ω 10%	R011015
R771	Carbon resistor ¼W 10Ω 10%	R011002
R781	Carbon resistor ¼W 10KΩ 10%	R011031
R791	Carbon resistor ¼W 10Ω 10%	R011002
R801	Carbon resistor ¼W 150Ω 10%	R011510
R811	Carbon resistor ¼W 5.6KΩ 10%	R015626
R812	Carbon resistor ¼W 82Ω 10%	R008206
R821	Carbon resistor ¼W 5.6KΩ 10%	R015626
R822	Carbon resistor ¼W 82Ω 10%	R008206
R831	Carbon resistor ¼W 5.6KΩ 10%	R015626
R832	Carbon resistor ¼W 82Ω 10%	R008206
R841	Carbon resistor ¼W 5.6KΩ 10%	R015626
R842	Carbon resistor ¼W 82Ω 10%	R008206
R851	Carbon resistor ¼W 5.6KΩ 10%	R015626
R852	Carbon resistor ¼W 82Ω 10%	R008206
R861	Carbon resistor ¼W 5.6KΩ 10%	R015626
R862	Carbon resistor ¼W 82Ω 10%	R008206
R871	Carbon resistor ¼W 5.6KΩ	R015626
R872	Carbon resistor ¼W 82Ω 10%	R008206
R881	Carbon resistor ¼W 10KΩ 10%	R001038
R882	Carbon resistor ¼W 330Ω 10%	R013314
R901	Carbon resistor ¼W 1MΩ 10%	R001054
R903	Carbon resistor ¼W 1.5KΩ 10%	R001520
R904	Carbon resistor ¼W 1.5KΩ 10%	R001520
R905	Carbon resistor ½W 4.7Ω 10%	R024798
R908	Carbon resistor ¼W 680Ω 10%	R016816
R909	Carbon resistor ¼W 390Ω 10%	R003913
R921	Carbon resistor ¼W 470Ω 10%	R014711
R922	Carbon resistor ¼W 220Ω 10%	R012218
R931	Carbon resistor ¼W 390Ω 10%	R013916
R932	Carbon resistor ¼W 220Ω 10%	R012218
R933	Carbon resistor ¼W 1.2KΩ 10%	R011222
R951	Carbon resistor ½W 150Ω 10%	R021513
R961	Carbon resistor ½W 150Ω 10%	R021513
R962	Carbon resistor ½W 100Ω 10%	R121015
R991	Carbon resistor 2W 8.2Ω 10%	R158295
VARIABLE RESISTORS		
VR111	Variable resistor 10KΩ B	R810148
VR151	Variable resistor 10KΩ	R800145
VR171	Variable resistor 50KΩ	R800543
VR172	Variable resistor 50KΩ B	R810546
VR181	Variable resistor 10KΩ A	R811037
VR311	Variable resistor 10KΩ	R800145
VR312	Variable resistor 10KΩ	R800145
VR313	Variable resistor 10KΩ A	R811037
VR341	Variable resistor 10KΩ	R800145
VR342	Variable resistor 200Ω	R802017
VR371	Variable resistor 10KΩ	R800145
VR481	Variable resistor 10KΩ	R800145
VR531	Variable resistor 470Ω	R890113

Reference Number	Description	Parts Number
VR601	Variable resistor 10KΩ B	R810148
VR602	Variable resistor 1KΩ	
VR641	Variable resistor 50KΩ B (with pull switch)	R815033
VR931	Variable resistor 200Ω	R802017
COILS		
L101	RX RF Coil HEL-0614	L014012
L102	RX RF Coil HEL-0615	L014025
L111	RX RF Coil HEL-0616	L014038
L121	RX MIX Coil HEL-0617	L014041
L141	IF Coil HEL-0670	L006703
L151	Choke Coil 470uH	L990042
L201	N.B. Coil HEL-0681	L006813
L211	N.B. Coil HEL-0682	L006826
L221	Choke Coil 10mH	L990039
L371	BM Coil HEL-0622	L014096
L411	IF Coil HEL-0623A	L014164
L412	TX MIX Coil HEL-0601A	L014177
L413	TX MIX Coil HEL-0602A	L014180
L421	TX RF Coil HEL-0603B	L014193
L431	TX RF Coil HEL-0624	L014106
L441	Choke Coil 1uH	L990055
L442	TX RF Coil HE-0553	L013262
L443	RFC HEL-0299	L085025
L451	Choke Coil 1uH	L990055
L452	Choke Coil HEL-0299	L085025
L453	Choke Coil HEL-0299	L085025
L454	TX RF Coil HEL-0553	L013262
L455	TX RF Coil HEL-0584	L023278
L456	TX RF Coil HEL-0584	L023278
L457	TX Trap Coil HEL-0553	L013262
L511	IF Coil HEL-0673A	L006732
L541	Choke Coil HEL-0555	L083043
L571	Variable Inductance HEL-0686	L006868
L611	VCO Coil HEL-0623A	L014164
L621	VCO BUFF Coil HEL-0623A	L014164
L631	Variable Inductance HEL-0675	L006758
L632	Variable Inductance HEL-0676	L006761
L661	Choke Coil 100uH	L990071
L911	Choke Coil HEL-0555	L083043
L912	Choke Coil HET-0156	T093017
L913	Choke Coil HEL-0555	L083043
L991	Choke Coil HEL-0560	L083014
L992	Choke Coil HEL-0560	L083014
L993	Choke Coil HEL-0560	L083014
L994	Choke Coil HEL-0560	L083014
L995	Choke Coil HEL-0560	L083014
L996	Choke Coil HEL-0560	L083014
TRANSFORMERS		
T1	Power Trans. HET-0171	T001711
T2	AF Trans. HET-0159A	T094016
T7	Choke HET-0156	T093017
CRYSTALS		
X131	Crystal 15.363 MHz	X023579
X571	Crystal 10.695 MHz	X026958
X681	Crystal 10.24 MHz	X022402
FILTER		
FL-1	Crystal Filter 10.6935 MHz	X194072
RELAYS		
K1	Relay HB2-DC 12V	K004022
K2	Relay HB1— DC 12V	K004019
SWITCHES		
S1	Power switch SDE4SA AU	S136042
S2	DC—AC switch SDE4SA AU	S136042
S3	DC power switch SDV-2P 3-TV3	S136039

Reference Number	Description	Parts Number
S4	MODE switch SRN2083N	S136013
S6	Noise Blander Switch SUE 54	S136547
S7	Tone Switch SUE 54	S136547
S8	PA-CB Switch SUE 54	S136547
S9	SP Switch SUE 54	S136547
S10	SWR Meter Switch SUE 54	S136547
S11	Clock Switch SPJ222	S136026
S12	Clock Switch SPJ222	S136026
MISCELLANEOUS		
J1	Antenna Connector	J190046
J2	MIC Jack	J136026
J3	DC Power Jack	J136013
J5	Phone Jack	J249133
J6	EXT. SP. Jack SJ-296	J090010
J7	PA SP Jack SJ-296	J090010
M1	S/RF Meter	M136026
M2	SWR Meter	M136013
SP	Speaker 8Ω 1W 92-607	A103033
PL1	Meter Lamp RM 5-14V-80-150RW	V100010
PL2	Meter Lamp RM 5-14V-80-150RW	V100010
F1	Fuse Holder	B020080
	AC Cord	B136013
	DC Cord	B136026
	Cord stopper NO. 5116	B136039
F1	Fuse 1A	B000055
F2	Fuse 3A	B000042
MIC	MICROPHONE	

CIRCUIT DIAGRAM

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Q51 2SC1359 2SC1675
Q38 2SC1359 2SC1675
Q13,14,15 2SC1359 2SC1675
Q13
Q14
Q15
Q17,18 2SC1815, 2SC828 2SC945
Q16 2SK19
Q17
Q18
Q23
Q24
Q59 2SC1815 2SC945 2SC828
Q57,58 2SC1359 2SC1675
Q59
Q25 2SK19
Q26
Q27
Q26,27 2SC1815 2SC828 2SC945
Q37 SN76514
Q19
Q19,38 2SC1815 2SC828 2SC945
Q40
Q52 TA7205
Q53 2SC1815 2SC828 2SC945
Q54 2SD235
Q43 2SC495
Q44 2SC1306
Q45 2SC1307
Q46 2SK19
Q95,96,93 2SD235
Q95
Q94 2SC1815 2SC828 2SC945
Q92 2SD586
Q94
Q93
Q96
Q39 TA7137P
L121
L511
L141
L571
X571
L371
L431
L541
FL-1
T1
T2
S1 POWER
S2 AC DC
S3 POWER (MAIN)
S4-1 AM LSB USB
S4-3 AM LSB USB
S5
S6 ON NB
S7 LOW TONE
S8 PA CB
S9 EXT INT
S10 SWR CAL
S11 FAST
S12 SLOW
K1-1
K2
P1
P2
P4 AC 117V 50/60Hz
J1 ANT
J2 MIC
J3 DC 13.8V
J5 PHONE
J6 EXT. SP
J7 PA. SP
SP
MICRORHONE PUSH
CLARIFIER
VOLUME
SQUELCH
CLAR-O-MIC
MIC GAIN
M
M2 SWR
M1 S/RF
TM4801P
TLR2037 D901
D902 TLG103
D907 TLR103
D908 TLG103
D905 1SI588
D911 D912 D913 D914 S3V10x4
D915 S3V10
D916 WZ071
D917 WZ096
D961 WZ096
VR931 200
VR641 50K(B)
VR601 10K (B)
VR602 1K
VR172 50K B
VR181 10K A
VR171 50K
VR931 10K
VR941 10K
VR961 50
VR951 150 (1/2)
VR962 100 (1/2)
VR371 10K
VR151 10K
VR152 10K
VR153 470
VR154 2P
VR155 100K
VR156 100K
VR157 100K
VR158 100K
VR159 100K
VR160 100K
VR161 100K
VR162 100K
VR163 100K
VR164 100K
VR165 100K
VR166 100K
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VR174 100K